## AMENDMENTS TO THE CLAIMS

1. Cancelled.

2. (new) A method of screening one or more test compounds for an effect on at least one cell using an analytical device comprising:

flowing one or more test compounds from one or more test compound sources through one or more microfluidic channels of the device, wherein the one more microfluidic channels have at least one cross-sectional dimension in a range from about 0.1 to 500 μm;

contacting the one or more test compounds with at least a first cell; and

detecting a cellular response of the at least first cell to the one or more test compounds in a detection zone of the device.

3. (new) The method of claim 2, wherein the one or more test compounds comprise a plurality of test compounds which are each fluidly coupled to a respective test compound source.

4. (new) The method of claim 3, wherein the one or more microfluidic channels comprises at least 10 microfluidic channels.

5. (new) The method of claim 3, wherein the one or more microfluidic channels comprises between 10 to about 500 microfluidic channels.

6. (new) The method of claim 2, wherein the method is for characterizing one or more receptors present in the at least first cell, wherein the one or more test compounds have an effect on at least one of the one or more receptors in the at least first cell.

7. (new) The method of claim 2, wherein the at least first cell is isolated from an *in vitro* source.

8. (new) The method of claim 2, wherein the at least first cell is isolated from an *in vivo* source.

9. (new) The method of claim 2, wherein the at least first cell is selected from the group consisting of a bacterial cell, a plant cell, a fungal cell, and an animal cell.

10. (new) The method of claim 2, wherein the cellular response is selected from the group consisting of cell proliferation, cell differentiation, cell activation, activation of a cell activity mediating enzyme, stimulation of messenger turnover in the cell, alteration of cell ion fluxes, activation of cellular enzymes, changes in cell shape, and an alteration in expression of a gene.

11. (new) The method of claim 2, wherein a pressure based fluid direction system is used for flowing said one or more test compounds within said one or more microfluidic channels.

12. (new) The method of claim 2, wherein an electrokinetic fluid direction system is used for flowing said one or more test compounds within said one or more microfluidic channels.

13. (new) The method of claim 2, wherein the analytical device comprises or is connectable to a computer so that the computer controls the device.

14. (new) The method of claim 13, wherein the computer controls fluid flow and direction within the device.

15. (new) The method of claim 13, wherein the computer is connected to the device via an adaptor module which provides environmental control over the device.

16. (new) The method of claim 2, further comprising a fluid interface for introducing the one or more test compounds into the device.

17. (new) The method of claim 16, wherein the fluid interface is one or more micropipettors.

18. (new) The method of claim 2, wherein the detection zone is configured to be coupled to a detector for measuring an effect of the one or more test compounds on the at least first cell by measuring a level of a detectable signal.

19. (new) The method of claim 18, wherein the detectable signal results from an effect of the one or more test compounds on a cellular function of the at least first cell.

20. (new) The method of claim 19, wherein the cellular function is cellular viability or cellular activity.

21. (new) The method of claim 18, wherein the detectable signal is provided by a label or a change in molecular weight.

22. (new) The method of claim 21, wherein the label is a chromophoric label or a fluorescent label.

23. (new) The method of claim 21, wherein the detectable signal is radioactive decay, electron density, change in pH, temperature or salt concentration.

24. (new) The method of claim 2, wherein the one or more test compounds comprise a plurality of test compounds which are each contained within a separate reservoir of the analytical device.

25. (new) The method of claim 24, further comprising transporting the plurality of test compounds from the separate reservoirs into a plurality of respective microfluidic channels using a pressure-based fluid direction system.

26. (new) The method of claim 1, wherein the cellular response comprises alteration in cell ion flux.